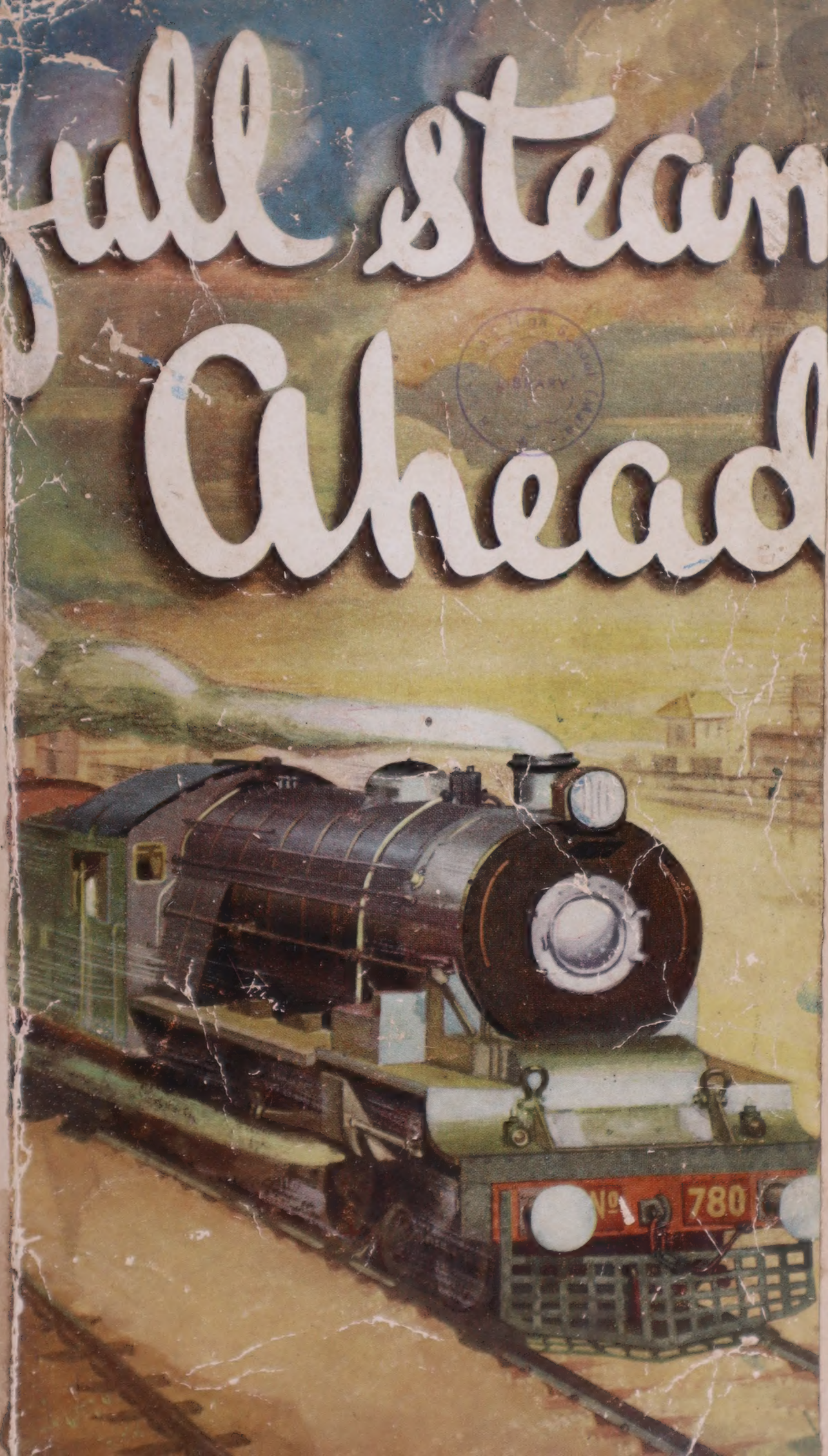
Full steam Ahead



Reading Room No: P/ND/SR/.....
B.A.N.M's Higher Secondary School
BANGALORE-1.

INDIA
SHOWING RAILWAYS
TIBET
MILES 50 0 50 100 150 200 250 300 MILES
NEPAL
BHUTAN
DARJEELING
DIBRUGARH
GAUHATI
LUMDING
PARBATIPUR
KATIHAR
MYMENSINGH
NABA
DARBHANGA
MUZAFFARPUR
GORAKHPUR
FYZABAD
CAWNPORE
GHAZIPUR
PATNA
BENARES
MOGHAL SARAI
JAMALPUR
KIUL BHAGALPUR
MANIKPUR
GAYA
MADHUPUR
GOMOH
ASANSOL
DACCA
AGARTALA
LAKSAM
RANCHI
BURDWAN
RANAGHAT
TATANAGAR
HOWRAH
CALCUTTA
CHIT
KHARGPUR
BILASPUR
SAMBALPUR
GONDIA
RAIPUR
CUTTACK
PURI
BERHAMPUR
VIZIANAGRAM
WALTAIR
COCANADA
PROME
RANGOON
Bay of Bengal
ANDAMAN ISLANDS
NICOBAR ISLANDS
MADRAS
N
W
E
S

This book belongs to Mohamed Mashood
Mohamed Mashood

FULL STEAM AHEAD

THE INDIAN RAILWAYS—THEIR PROBLEMS AND THEIR WORK, AND THEIR FUTURE PLANS

ISSUED BY
THE PRESS INFORMATION BUREAU, GOVERNMENT OF INDIA, FOR THE RAILWAY BOARD

PRICE 8 ANNAS

RUPEE IN POUNDS AND DOLLARS

Re. 1 is approximately 1*sh.* 6*d.* or 30.05 cents.

Rs. 100 are approximately £7-9-6 or $30.05.

Rs. 1,000 are approximately £74-14-10 or $300.53.

Rs. 1,00,000 (a lakh) are approximately £7,473-19-2 or $30,053.

Rs. 1,00,00,000 (a crore) are approximately £747,395-16-8 or $3,005,259.

100,000 is one lakh (1,00,000).

10,000,000 is one crore (1,00,00,000).

COINAGE

3 pies	.. ..	1 pice.
4 pice	.. ..	1 anna.
16 annas	.. ..	1 rupee.

GREAT INDIAN PENINSULA RLY. ★ MADRAS & SOUTHERN MAHRATTA RLY. ★ NORTH WESTERN RLY. ★ OUDH TIRHUT RLY. ★ SOUTH INDIAN RLY. ★ BIKANER STATE RLY. ★ JODHPUR RLY. ★ MYSORE STATE RLY. ★ H.E.H. THE NIZAM'S STATE RLY. ★ BENGAL ASSAM RLY. ★ BENGAL NAGPUR RLY. ★ BOMBAY BARODA & CENTRAL INDIA RLY. ★ EAST INDIAN RLY.

T'S H.S (M LIBRARY
B lore 42
Accessi No; 3814
U.D.C No: 82 N
Date; 23-8-82

CONTENTS

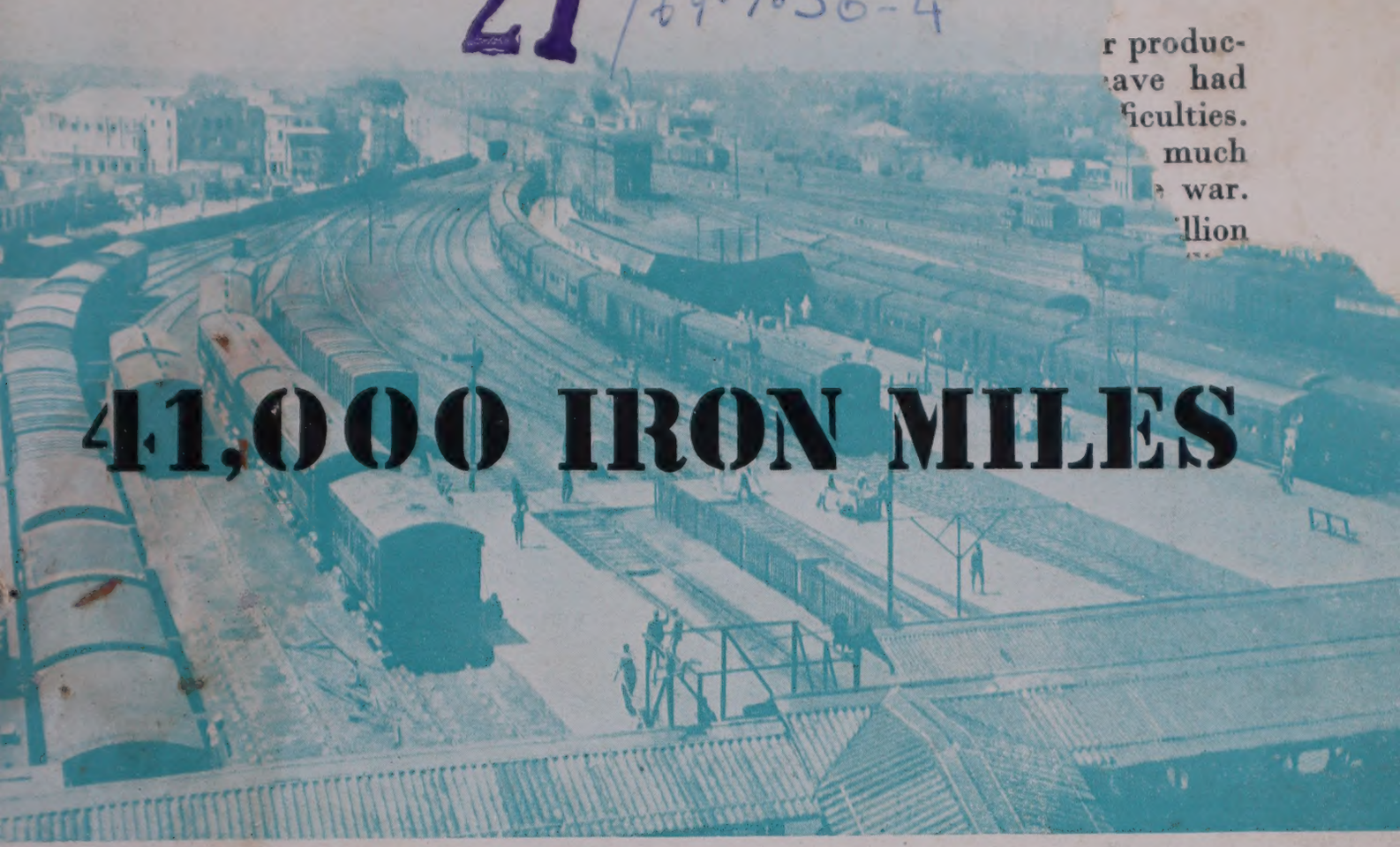
	Page
41,000 IRON MILES ..	5
M ONS OF THEM ..	10
WARTIME PROBLEMS ..	15
TACKLING THE PROBLEMS	20
IN BATTLE DRESS ..	31
THE ARTERIES	40
LOOKING AHEAD ..	48

Reading Room [redacted]/SR/.....
R.B.A.N.M's High[redacted]ndary School
BANGALORE-1.

Introducing the Indian Railways

A railway headquarters

21 / 69-70 So-4



r produc-
ave had
ficulties.
much
war.
llion

41,000 IRON MILES

Every minute the Indian Railways are carrying 64,000 passengers and 52,000 tons of goods one mile. The 41,000 iron miles criss-crossing the country carry 90 per cent of its mechanically drawn traffic. Every inch of this track is inspected at least once a day to ensure that each one of the millions of bolts holding the rails together and each spike or key holding the rails to the sleepers is in order.

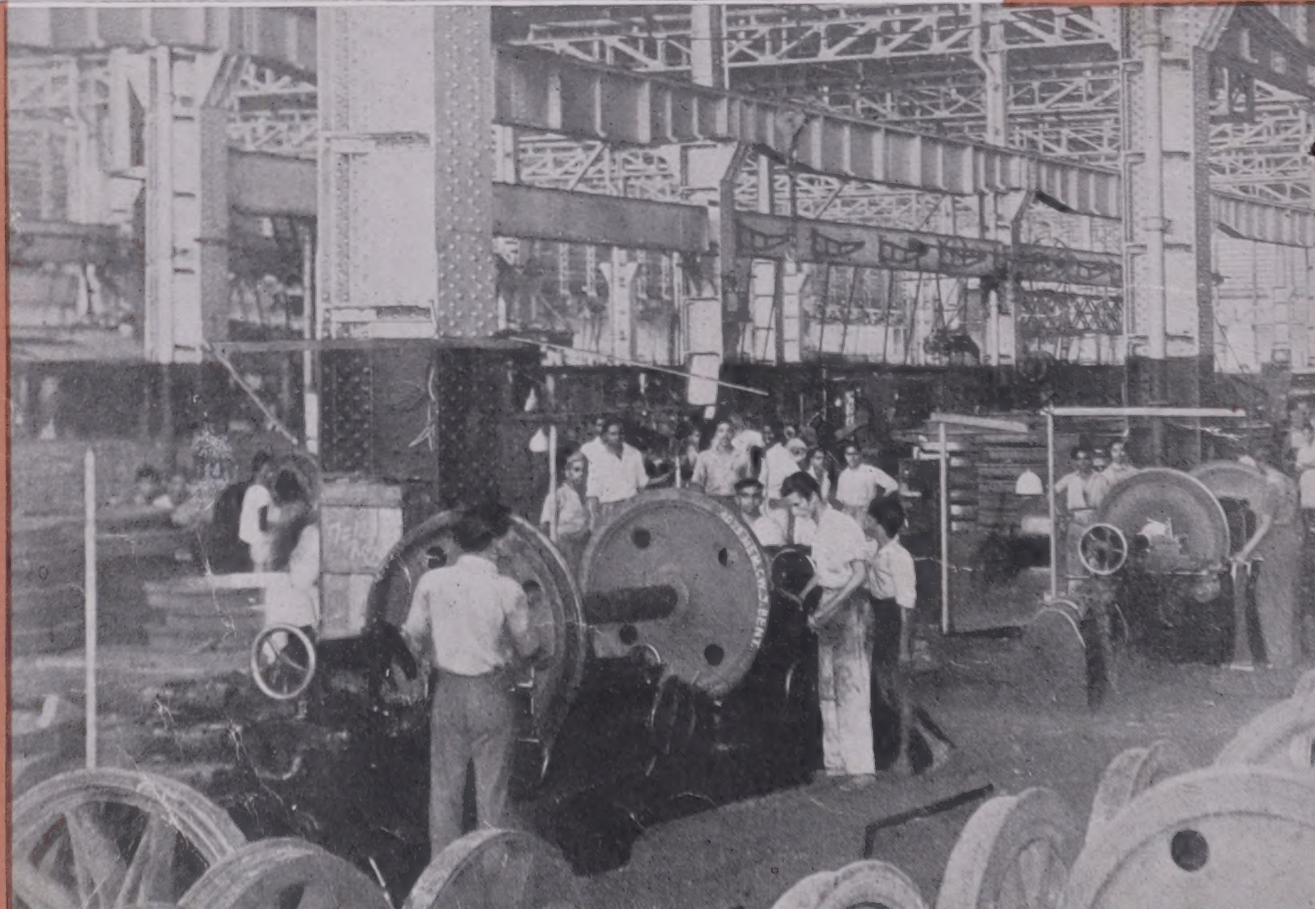
With a capital of Rs. 800 crores invested by the State, the Indian Railways are one of the world's largest enterprises. One in every 400 persons in India is a railwayman; one in every 100 looks to the Railways for his living. The ticket issued to you at the start of a journey is one of 80 million printed each month.

The Railways annually spend crores of rupees on renewals, replacements and capital construction. During the 10 years preceding 1940-41, railway purchases of articles of Indian origin amounted to Rs. 94 crores. In 1943-44 alone they amounted to Rs. 21 crores.

Rail transport is cheap. The average cost of carrying one seer of rice or wheat over 100 miles is less than a pie, of carrying one seer of salt or sugar slightly over a pie, one pair of dhotis just over $1\frac{1}{2}$ pies.

One of the most important functions performed by Indian Railways is the transport of coal, which absorbs nearly 40 per cent of their total ton mileage. In 1944-45 over a million wagonloads were required for this purpose. Transport of grains and pulses absorbed more than 600,000 wagonloads.

A locomotive just assembled



In a railway workshop

Climates of a Continent

Indian trains serve areas of sharply varying geographical and climatic features. Temperatures of 146 degrees F. have been recorded on the footplate of the engine hauling the Karachi Mail across the fiery desert sands of Sind in June. In contrast, seldom does a winter pass without some train being held up by frost or blizzard in the wild mountainous regions of Baluchistan.

There are 7,200 stations. Kan Mehtarzai (in Baluchistan), 7,221 ft. above sea level, is the highest railway station in the country. Mountain railways carry thousands of visitors to and from the hills every year. Among these are the Kalka-Simla (60 miles), Darjeeling-Himalayan (51 miles) and Mettupalayam-Ootacamund (29 miles) lines. The 17-mile Mettupalayam-Coonoor section of the last-named railway, which goes up the Nilgiris or Blue Mountains, has extremely steep gradients and is worked on the rack system.

In Bombay and Madras electric trains carry thousands of office workers staying in the suburbs to and from the city. Some of them travel 40 miles each way. One of the suburban electrical services carried 84 million passengers in 1943-44. There are even people living in Lonavla, 80 miles away, who go to Bombay every day for business or work.

Then And Now

More than 40,000 separate items of stores—ranging from a pin to a boiler—are required for operating the railways. With overseas supplies of materials largely cut off and some of their own shop capacity given over to war production, Indian Railways have had to face most serious difficulties. Yet, they are carrying a much heavier load than before the war.

Before The War, 45 million passengers travelled 1,525 million miles each month ;

In Wartime, 80 million passengers travelled 3,000 million miles.

Before The War, a train generally had eight to ten carriages ;

In Wartime, it had 13 or more (but not all of them were available for civilian passengers).

Before The War, the Fighting Services required only 29 special trains to run 8,000 miles each month ;

In Wartime, they needed 920 such trains to run a million miles.

Before The War, 10 million tons of goods were transported each month over 1,850 million miles ;

In Wartime, $11\frac{1}{2}$ million tons of goods were carried over 2,500 million miles.

The First Railway

Railway construction had two main objectives in the beginning—to open up the country for trade and commerce, and to connect places of strategic importance for its effective defence. A third important consideration was added after the great famine of 1878—protection against famine and mitigating its effects. During the critical second half of 1943 the Railways transported 1,275 tons of rice a day on an average into Bengal. In all they moved 700,000 tons of essential food grains into the province during this period in spite of the four main tracks into

Busy at the counter

Supplies for the Armed Forces being unloaded

To the mighty Himalayas

Calcutta being breached by heavy floods.

The first Indian railway was constructed between Bombay and Thana, a distance of 22 miles, in 1853. For nearly a century the Railways have been making steady progress as the main arterial system in India's internal economy and foreign trade. The speed with which travel is now possible, as compared with the slow-moving bullock, horse or camel cart of the last century, has transformed India from a land of isolated villages into a closely knit country, with distant parts brought nearer one another and nearer the outside world.

Today the apples of Kulu are marketed in Calcutta. The products of the handlooms of Madras are available in Lahore and Simla; and those of the silk looms of Murshidabad, Bhagalpur and other weaving centres of Bengal and Bihar are bought in Delhi and Bombay. The sugar produced in the factories of the United Provinces and Bihar goes into the coffee consumed in Madras. Raw cotton is brought from the growing centres chiefly to Bombay and Karachi and thence shipped to foreign countries. Before the war some three million bales of cotton were exported every year.

MILLIONS OF THEM

When war broke in the West in 1939, the Indian Railways were emerging from the effects of the general depression. Personnel had been reduced to a minimum and the amount of rolling stock maintained at the lowest economic level. The Railways' initial task was to move the Indian Army overseas and to keep it supplied. Later they were called upon to provide engines and rolling stock as well as personnel for building and maintaining railways overseas.

The entry of Japan into the war completely altered the picture. Railway activity had to be switched over from North-West to North-East India to meet the changed direction of military operations and to bring in the thousands of refugees from Burma and Malaya. Supplies to China had also to be maintained.

All this had an inevitable effect on train services for civilians. Passenger services had to be curtailed and rigid control introduced on goods traffic.

Transport in wartime is a problem both to those in charge of it and to those who use it. A traveller is born every minute; not, however, a coach or a locomotive. Travel, therefore, is not exactly a pleasure; trains sometimes run late, and there are fewer of them than we would wish.

Not only have more people been travelling during these years, but they have been travelling

A troops special—off to the front

Wagonloads of military vehicles

longer distances. Passenger miles increased from 18,743 million a year before the war to 32,483 million in 1943-44. The average distance that a passenger travelled went up from 35.3 miles to 41.2. One hundred and fifty-six million more journeys aggregating 6,300 million more passenger miles —the equivalent of 600 trainloads of people per day—were made in 1944-45 than in the previous year. Seven and half million wagons carried 90 million tons of goods in 1944-45. Passenger miles increased between 1938-39 and 1943-44 by 74 per cent ; ton miles by 28 per cent.

Against the ever-increasing volume of travellers must be set the reduction in passenger train services necessitated by the war. Such reduction amounted to 37 per cent.

Long Movements

Before enumerating the measures adopted to meet the greatly increased demand, it might be worth while to examine the nature of the country's requirements. Even in peacetime there were no material movements of luxury traffic. Few areas in the country are self-supporting. Essentials must be obtained from the sources of supply, which are often confined to specific areas far afield from the demand. Thus almost all the coal is obtained from Bengal and Bihar —every ton of coal burnt in the fire-boxes of North Western Railway engines has to come an average of well over a thousand miles

About to depart

Petrol tank special

from Bengal—and with the partial closure of the east coast ports, considerable quantities of coal which previously moved by sea had for some time to go by rail.

Foodstuffs must move from provinces that have an exportable surplus to deficit areas. Over $2\frac{1}{2}$ million tons of foodstuffs required transport in 1942-43, involving movements between places as far apart as the Punjab and Madras (1,700 miles) or the Central Provinces and the Malabar coast (1,400 miles). Rice particularly has had to be moved long distances in replacement of the $2\frac{1}{2}$ million tons imported previously.

The public naturally feels most the difficulties of passenger travel. The aim in passenger traffic, in wartime, must be first to move all the soldiers who have to be moved under military necessity, and then to make the best possible arrangements to meet the greatly increased civilian traffic partly necessitated by wartime activities.

As for goods, the aim is to move as much traffic as possible, at least essential traffic. Coal raisings fluctuate widely at different seasons since many of the miners work on the land part of the year. The fluctuation in the demand for coal wagons, therefore, has an immediate and inescapable effect on the ability of the Railways to move other traffic. Military operational moves had to come first, and coal and Government food programmes had to be moved in very high priority.

A wagon from abroad

Coal traffic

WARTIME PROBLEMS

The problem, thus, was to move not only military traffic but also the mounting civil or semi-military traffic which arose out of the conditions created by war. The stress, which was both acute and sustained, was complicated by the fact that the goods to be carried were entirely different from those in peacetime. With cranes in short supply, heavy and awkward military machines and weapons had to be dealt with in place of the usual types of goods which are more easily handled, and very often the heaviest traffic had to be moved over routes which were not designed for the purpose. Owing to constant unforeseeable changes in the progress of battle, arrangements had to be made, or modified, at very short notice. It was essential that trains arrived with the right consignments in the right order and on time, to ensure continuity of handling at ports or military railheads.

Nature Takes A Hand

Sometimes Nature is the enemy. In July 1941 floods on the B.B. & C.I. Railway dislocated traffic on the main line between Bombay and Delhi for three weeks. The following year a vital section of the Bengal and Assam Railway was breached for four months. On the other side of India the Indus burst its banks and caused great damage on the North Western Railway, Quetta being isolated for some months. In November of the same year a severe cyclone interrupted traffic between Calcutta and Madras. The Bengal Nagpur

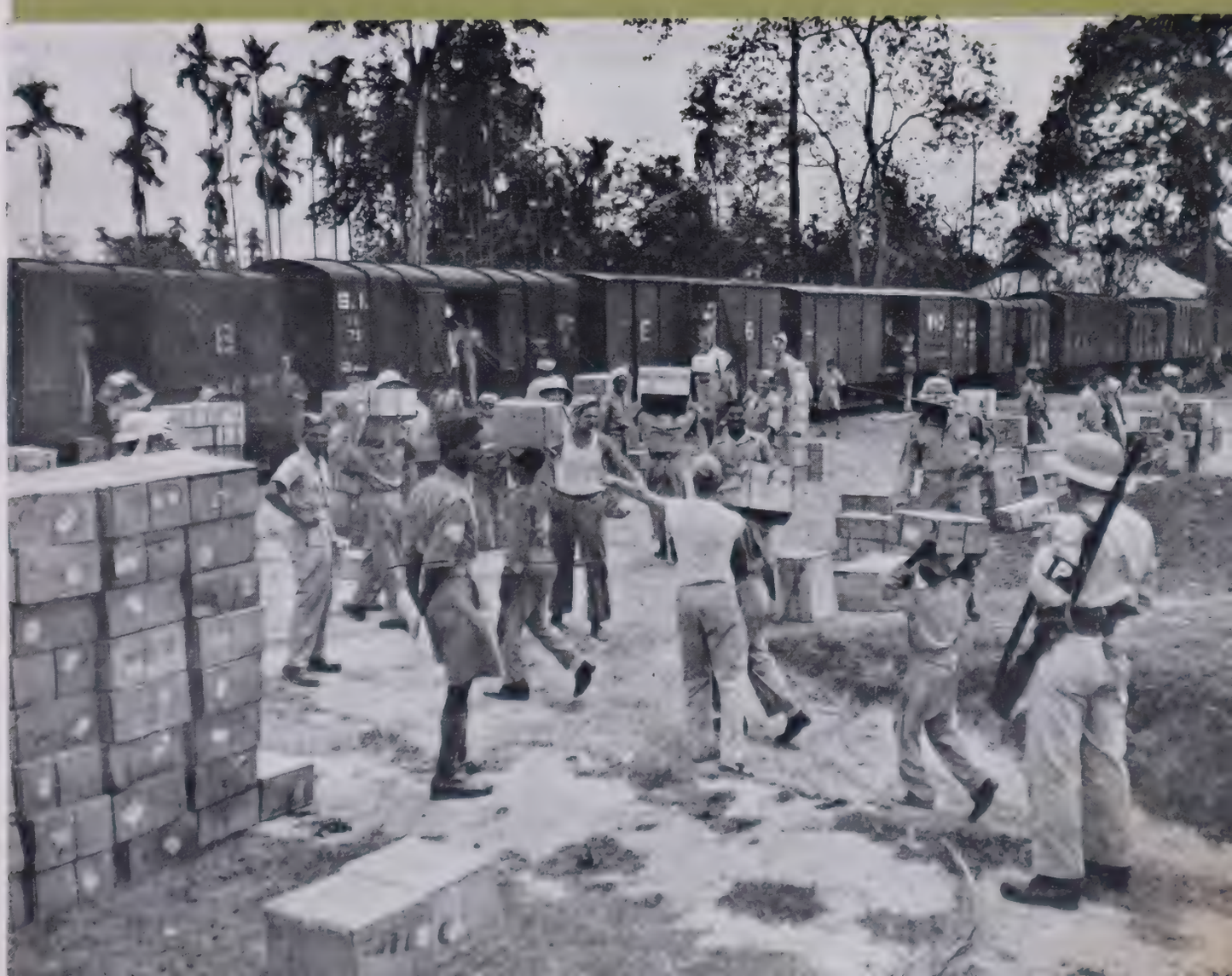
Ambulance train being loaded

Railway suffered heavily, the East Indian Railway to a lesser extent. Perhaps the greatest setback suffered by the Indian Railways occurred in July 1943 when the E.I. Railway was breached at several points by the Damodar river bursting its banks. This happened just at a moment when food for the famine-stricken people of Bengal and coal and raw materials for her industries were most vital. Only the most exceptional effort prevented a greater disaster. The B.B. & C.I. Railway was again the victim in 1944, when the Tapti and Narbada rivers overflowed their banks and caused widespread damage. The Narbada floods were the highest on record since 1876.

The Bengal famine imposed another serious obligation on the Railways—that of ensuring that

Carrying armoured carriers

From river to rail



After the flood

Welding operations in a railway workshop

A railway grain shop

their own staff could obtain the necessities of life at prices within their means. This additional call on their staff for the organisation and running of hundreds of both static and mobile grain shops coincided with the greatest demand made on them by the military authorities for the movement of supplies to the forward areas to meet the Japanese threat to India, and by the civil authorities for the movement of food grains to stricken areas.

Making Do

Stores have had to be obtained in the face of overwhelming difficulties. The stores departments of most railways had accumulated stocks when supplies were available, but as the war progressed, supplies from overseas became increasingly difficult to obtain. Very large numbers of spare parts and stores that were formerly imported have been locally made; others impossible to secure have been fashioned from worn-out parts. Improvisation and invention, economy and salvage—only these have made operation possible.

The work of the Railways in wartime has to be considered against the background of coal shortage and a serious deterioration in the quality of coal, which rendered imperative the most rigorous economy and fruitful usage of fuel; the employment of thousands of railwaymen on munitions work; loss of experienced personnel to the Fighting Services and the need to train large numbers of fresh recruits; abnormal working conditions; and the difficulty, under an India-wide demand for skilled labour, of maintaining adequate repair staff in the main railway workshops from Lahore in the north to Trichinopoly some 1,700 miles south, from Calcutta in the east to Bombay, a thousand miles further west.

TACKLING THE PROBLEMS

It was impossible for the Railways to meet the largely increased demands without a considerable development of line capacity, large increases in stock, and more locomotives and rolling stock. India's needs of the last two, however, could only be considered after those of more important operational areas, so a start was made with improving line capacity and securing and training the staff that would be required.

Lines Doubled and Quadrupled

Lines were doubled and quadrupled to remove bottlenecks, additional crossing stations, loops and sidings provided, yards improved, new watering stations opened and better coaling arrangements made for engines. Communications by means of telephone and telegraph were extended and radio services were established; train control systems were expanded to ensure the quickest possible movement.

A total of 20,000 miles of new trunk telephone, train control and telegraph circuits are under construction, and a number of these lines are already operating on sections carrying heavy traffic. With improvised materials the Railways have carried out many improvements to train and traffic control offices. A teleprinter network has been planned to cover the principal Railways throughout the country and the first circuits are already in operation. Wireless has been introduced to give a direct and flexible means of communication. Wireless stations have been set up between railway headquarters and divisions, which in turn are linked up with their principal junctions. Mobile sets are also in operation, especially

Back to work after overhaul

Store train and empty special

Assembling a locomotive

Railway telegraph signallers' class

during floods and breaches when line communications on a section have been destroyed.

Since the start of war, 35 miles of new single line and 405 miles of doubling or quadrupling had been completed up to the end of August 1945. In addition, 204 crossing stations, loops at 201 stations, lengthening of loop at 180 stations and remodelling of 30 large station yards have been completed. In all some 3,500 miles of track material have been arranged. Despite the difficulties arising from shortage of materials and labour and the pressure of every-day maintenance work, the engineering departments have succeeded in providing the equivalent of a good-sized railway system.

The effects of doubling are well demonstrated by the Midnapore-Bankura section of 63½ miles, whose capacity was increased by 180 per cent. A feature of this doubling was the speed with which the work was carried out. The scheme involved earthwork of 35 million cubic feet, the provision of 10,000 cubic feet of reinforced concrete and 76 girders, the remodelling of 10 stations and the laying or shifting of well over 100 sets of points and crossings, the transportation and laying of 1,200,000 cubic feet of stone ballast for cuttings and 2½ million cubic feet of ashes and moorum for banks. The first section was opened less than six months after work had begun on the project, the second a month later, the last by the middle of the following month.

An example of quadrupling is provided by the construction of

Guiding the trains without seeing them

a fourth line between Asansol and Khana, on the East Indian Railway. This involved the laying of 52.25 miles of track, which required over 15 million cubic feet of earthwork, while 281 bridges and culverts had to be built. The entire work was completed within about 12 months.

Making the Most of Engines

To cope with the additional traffic, more intensive use of available locomotive power became necessary. Before the war, goods engines went into shed after an average run of 120 miles; today this mileage is between 250 and 450. Passenger engines in pre-war days did a round trip of 250 miles before going to shed ; the present average is between 500 and 650 miles.

The loads of trains have been stepped up to the maximum limit and new techniques introduced to improve the standard of locomotive maintenance. A passenger train now carries 32 per cent more load than before the war, a goods train $8\frac{1}{2}$ per cent more. In spite of this heavy strain thrown on the locomotives—50 per cent of which on the broad gauge are over 30 years of age—not more than 15.91 per cent of them are in shed and workshop for repairs, against 14.34 per cent in the U.K. (Minor repairs are attended to in running sheds, cases requiring heavy repairs or periodic overhaul are dealt with in workshops). For the U.S.A. figures are available only of locomotives undergoing repairs in workshops and the latest information is that 5.2 per cent of them are temporarily out of service on that account. The corresponding figures for India and the U.K. respectively are 5.5 and 5.66, in spite of the fact that in India all the material and spares necessary for repairs are not readily available. In locomotive and wagon maintenance the Indian Railways, to quote a very highly placed British railway official, "have nothing to be ashamed of."

Special investigations are being made in order to increase the mileage between boiler washouts, which necessitate an engine being out of service for at least 18 hours and thus cause wastage of power. On some railways the mileage has been considerably increased.

Fuel Economy

Fuel has been an increasingly difficult problem, but economy measures, which have been in force for many years, have been intensified. In spite of the poor

Bridling the floods

One of the mighty bridges built by Indian Railways

quality of coal now available for locomotives, the Railways have effected large saving in fuel consumption by (*a*) converting a number of locomotives from coal-burning to oil-burning; (*b*) using alternative fuels such as cinders and wood, in place of steam coal, in stationary boilers and shunting engines; (*c*) trip fuel control whereby actual fuel consumption on a locomotive for any one trip is checked against a definite ration.

Indian Railways have secured world records in the movement of rolling stock. One railway registered an average of 95.4 wagon miles per wagon day on its metre gauge section in a recent month. The average load of a broad gauge wagon has been raised from 52 to 74 per cent of a wagon's maximum capacity, which is higher than the relative figures of certain leading American railways.

First Things First

The Railway Priority Organisation, which came into being in March 1942, was introduced to meet greatly increasing demands on rail transport. It has three main functions. The most important has been quick movement, in order of their importance, of commodities essential to the war effort and civil needs; the second is the elimination, as far as possible, of wasteful movement; and the third function is the co-ordination of rail with other forms of transport. Railways have been divided into groups, each under a Regional Controller with authority to regulate movements within and into his region. These Controllers are assisted in their work by priority panels consisting of the

Feeding the engine

House-to-house service

At a quay

Timber waiting to be loaded

local representatives of the Central Government and those of the Provincial Governments. A uniform skeleton priority list embodying the main items for which priority is given has been adopted and all Regional Controllers have prepared priority lists for railways in their areas fitting into the skeleton heads particular commodities requiring special treatment owing to regional needs. Advance programming of the principal commodities by Departments of Government in consultation with the Priorities Organisation at the Centre helps to eliminate cross movement, but where necessary, a ban is placed on the movement of particular commodities from one area to another. A good illustration is the programme for the movement of essential food grains from surplus to deficit areas prepared by the Food Department in consultation with the Priorities Organisation.

Diversion of Traffic

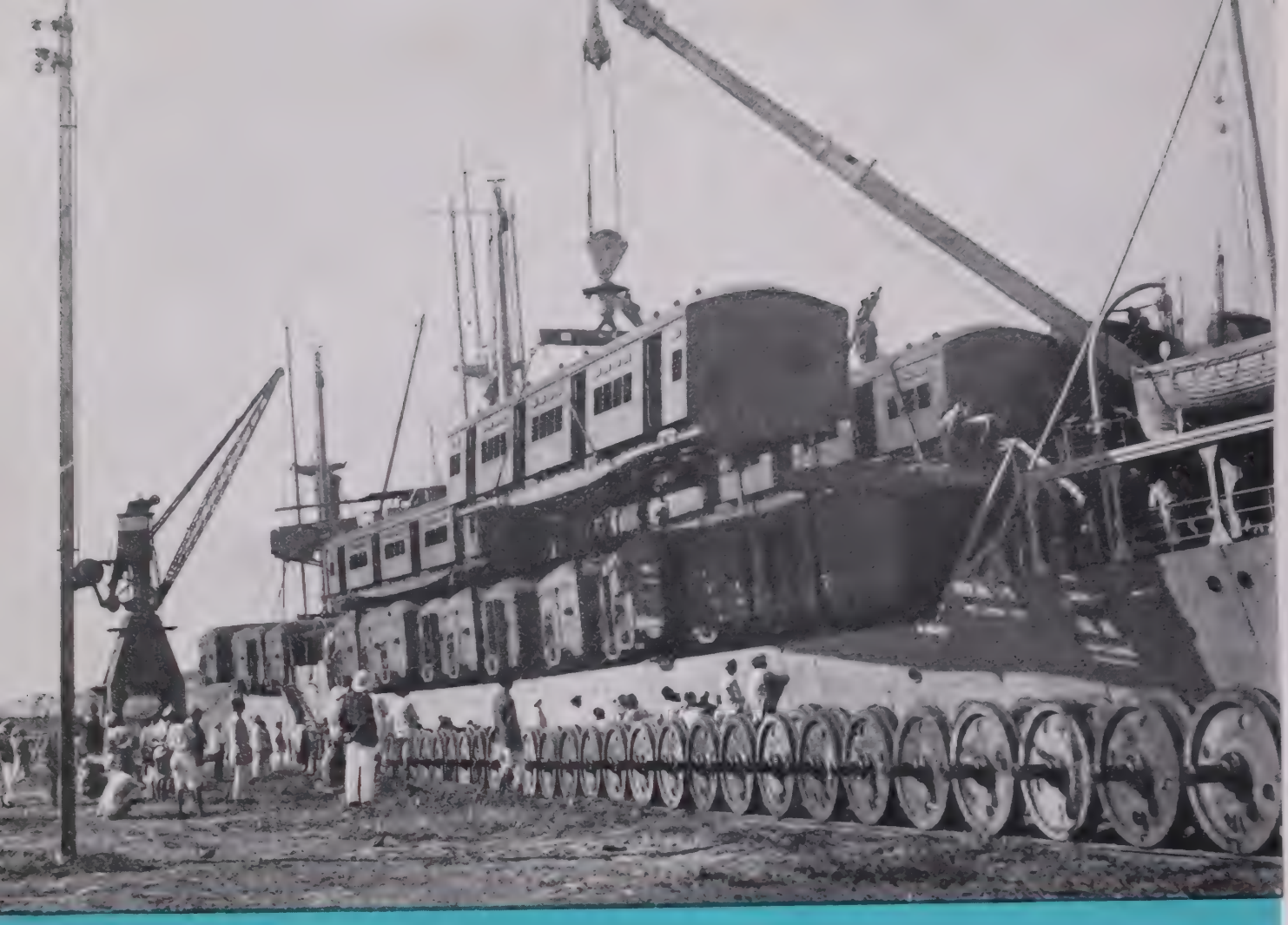
To relieve the wartime strain on railways, traffic was diverted to as great an extent as possible to coastal steamers and country craft. In some areas goods were denied transport by rail between certain points and forced on to the sea route. Wherever there were suitable roads and road transport, traffic was diverted to them. Some railways themselves started road transport services to prevent bottlenecks in the movement of traffic. One such carried 160 tons of coal per day to tea gardens, and returned with the tea from the gardens. This relieved two important transhipment points of supply to the Burma Front.

IN BATTLE DRESS

The Indian Railways went all out to speed victory. More than 50,000 technical personnel trained in 50 trades for the Armed Forces and the Labour Department ; more than 1,400 miles of line laid in military depots and airfield sidings ; more than 1,200 miles of track sent overseas ; ambulance trains, shells, bombs, armoured cars, pontoons, hand grenades, bayonets, other items too numerous to name, and turned out in their thousands —that is the job the Railways did for others even while they strained to do their own.

Munitions Production

Outside ordnance factories the main potential for the production of munitions, when war broke out, was the railway workshop. Overnight these workshops switched over from peacetime to war production and poured out—quickly, methodically and in an increasing stream—armaments, munitions and other war material. Shells were machined from bar and rough. Fuse bodies were manufactured, as also detonator plugs. Various components for gun carriages were turned out. Bayonets were manufactured by the hundred thousand. One workshop manufactured armour-piercing shot for the first time in India, and this was found equal to the best English shot. Machining of ordnance materials was a



Railway carriages go to war

Transporting munitions

Railway workshop mass producing grenade dischargers

Timber being stacked at a reserve base

process which had never been previously attempted in any workshop other than ordnance factories.

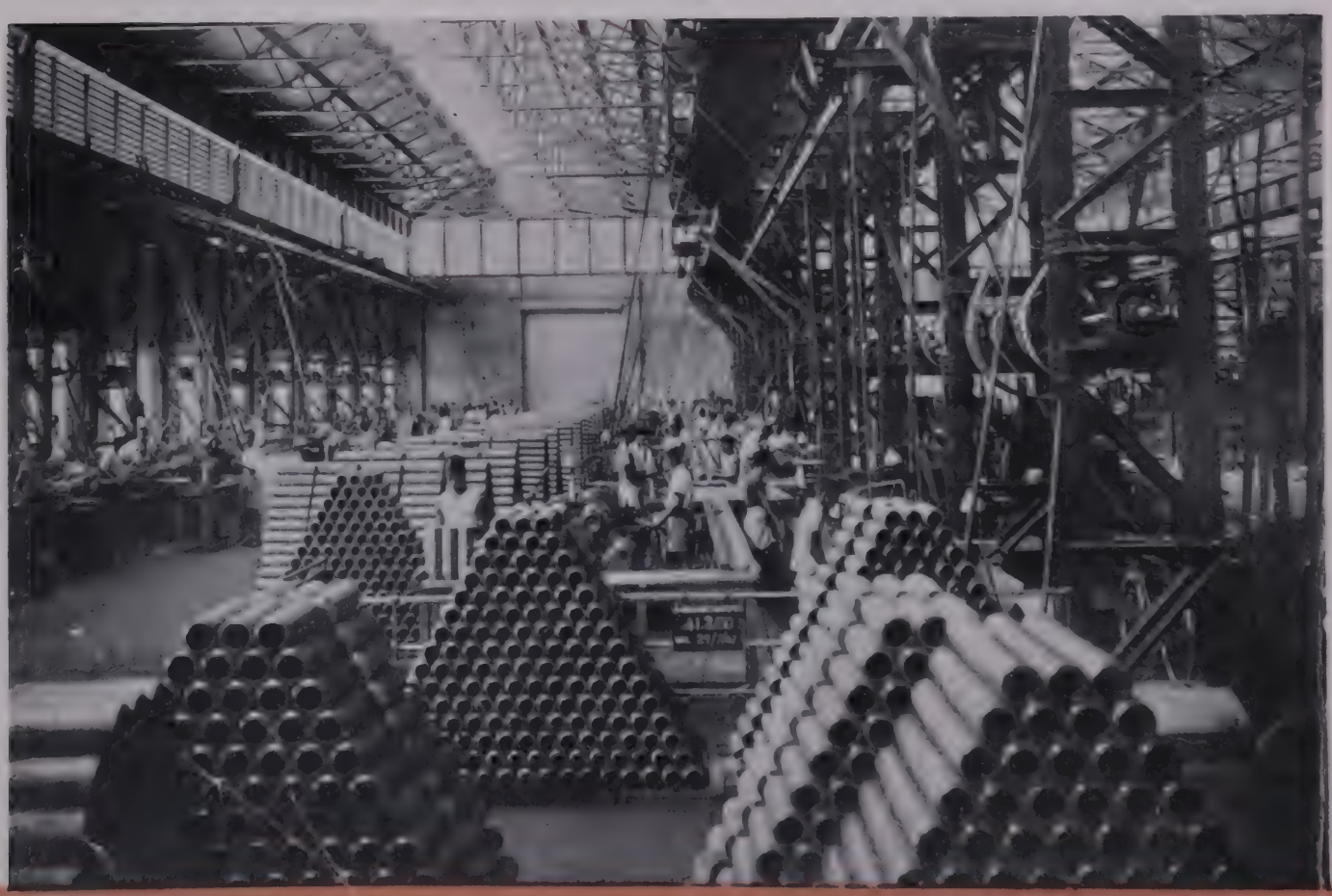
Besides ordnance materials proper, modern warfare requires thousands of other items ; and many of them were produced in the railway workshops. Motor lorry bodies, stirrups, tent poles and steel sleepers were manufactured. Miniature apparatus consisting of electrical targets, dive-bombers and natural lighting effects for training fighting vehicles gunners was prepared. Ammunition boxes were made and grenade bodies cast and machined. Manufactures ranged from such minute items as small valves for blow lamp oil cookers to armoured cars and field artillery tractors.

Engineering Effort

Railway engineers undertook a variety of special works for the Fighting Forces, one of which was the construction of military bases served by railway sidings. Over 1,400 miles of military sidings and 70 miles of permanent and 153 miles of temporary sidings for airfields were constructed. This work involved much engineering and transportation effort in the carrying out of surveys and in the building and laying of permanent way, together with large numbers of turnouts or points. The Railways have delivered about 13 million tons of material for the construction of airfields.

Indian railwaymen have done a job of work in providing and

Shells by the million



Adapting underframes for military work

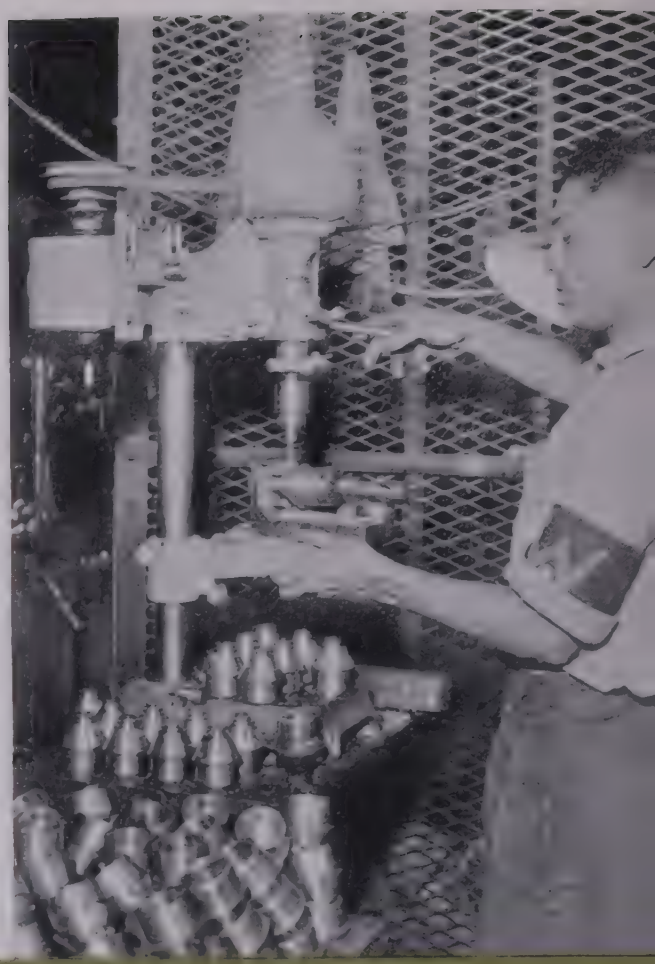
maintaining the artery to India's—and probably the Empire's—largest military base, at Avadi, near Madras. Over 125 miles of track have been laid here, the work involving 70 million cubic feet of earthwork and each stage being completed within the target date fixed by the Army.

Help in Manpower

Nor did the Railways lose time in helping with manpower. They raised military units of different kinds. From the workshops and from all other branches of the service they supplied thousands of men for military railway companies. Skilled workmen with technical training were wanted in very large numbers for ordnance manufacture. The growing need for war technicians was clearly realised early in the war, and a scheme was drawn up for their speedy training. Railway workshops played an important role in this work and trained fitters, copper and tin smiths, turners, machinists, blacksmiths, electricians and electroplaters.

Supplies for Overseas

India's contribution in railway materials for overseas amounted to crores of rupees. The supplies consisted of locomotives, coaching stock and wagons, as also track, turnouts, crossings, turn-tables and miscellaneous railway stores. Large quantities of rails, sleepers and rolling stock were provided for building vital lines of communication in the Middle East theatre—communications which later not only helped in defeating the Axis plans for an invasion of India through Egypt, Iraq and Persia, but played a large part in the final liberation of North Africa. The line to Persia was busy with supplies of jute, tea and other



More weapons of war

In battle dress

goods for Russia, and trainloads of Polish refugees came to India over that single line of railway stretching across the desert that links India with her western neighbour.

Moving Troops and Stores

Without the proper functioning of the railway system an army is unlikely to be in the right place at the right time with sufficient forces, declared Field Marshal Wavell. Military movement in terms of special trains increased 30 times since the start of war. During certain periods the Railways were carrying more than 1,162,000 tons of essential stores and 550,000 military passengers every month. The main problem in military traffic is the enormous distances involved —stores for the troops on the north-eastern front had to travel 800 miles on an average. Ships had to be unloaded, reloaded and sent away from the ports as quickly as possible. Keeping the ports clear has been one of the Railways' biggest tasks. Inward and outward military freight movement, which ran into hundreds of thousands of tons a month, was one of the biggest problems. About 30 special trains a day had to be accurately timed and some even had to make the journey from Karachi to Ledo, a distance of 2,760 miles. Twenty trains are required to move the personnel of one division and a further 48 trains to move its vehicles, guns and stores. Often the Railways had to make moves of this sort at a moment's notice.

To maintain the campaign in Burma, and the lift over the "hump", stores had to be moved sometimes 1,800 miles across India, transhipped from broad to metre-gauge, and from rail on to river flats, and lastly from river flats to rail again before proceeding to final unloading points. At one time 15 million wagon miles per month were being covered in maintaining these points alone.

During the Japanese offensive in April 1944, three divisions were moved into the fighting zone by rail, river and air, without disturbing the maintenance arrangements. This means that 80 additional trains were run over the congested railways in Eastern India during $2\frac{1}{2}$ weeks.

The movement of military traffic over railways presents many special problems. Personnel must be moved as complete units, sometimes together with their equipment, which varies from fractious mules to tanks, from grenade mortar rifles to 25-pounder guns, from the Jeep to 16-wheeler trucks, from bulldozers to 10-ton cranes. Personnel must be able to maintain contact with headquarters, must reach certain places at certain times so as to be able to replenish rations and water, must board and get off trains to schedule to reach their final destination at a specific time. The transport of special types of equipment calls

A railway First Aid A.R.P. unit

A railway canteen

Tea while you wait

for the provision of special loading ramps and sidings, perhaps with crane facilities ; the provision of types of rolling stock suitable for carrying particular items, and often the adaptation of such stock to accommodate projecting parts and allow sufficient clearance for the negotiation of bridges and tunnels ; the careful working out of loads so as not to impose too great a strain on certain sections of the permanent way, particularly bridges ; and the maintenance at strategic centres of sufficient rolling stock.

Moving Refugees and Evacuees

Japan's entry into the war brought about a large exodus of the population in the east coast areas, and the Railways evacuated a million passengers by special trains from Calcutta and elsewhere. Hardly had this traffic subsided when they were confronted with the problem of refugees from Japanese-occupied countries. One railway conveyed, on occasion, 3,000 to 6,000 refugee passengers per day, and ran 132 special trains between February and June 1942.

Travelling Blood Bank

Various kinds of rolling stock were constructed in the railway workshops for the use of the Fighting Services. Ambulance coaches were built, and ordinary stock was converted into ward cars, military cars and kitchen cars. A notable instance of improvisation is the transformation of a tourist car into a blood transfusion coach in which the Army Transfusion Service toured the country and collected blood from voluntary donors. The Railways converted broad-gauge wagons into refrigerator vans to transport army imports of frozen meat from ports to consuming centres. These imports assisted in the supply of meat for the Army, which previously depended entirely on supplies from Indian sources.

The railway staff throughout the country spontaneously responded in men and money to the cause of national service. Officers and men joined active military service and were drafted to departments directly connected with the war. They gave their spare time to A.R.P. duties and volunteered as Civic Guards.

The contributions of railwaymen to war funds and charities ran into several lakhs of rupees. Purchase of fighter craft, ambulance work, the Viceroy's War Purposes Fund and subscriptions to Defence Loans were some of the objectives for which money was forthcoming. Railwaymen and their families have tended refugees and evacuees, and have been running hundreds of free canteens for troops passing through stations.

THE ARTERIES

All principal railways are now owned by the State as a result of the policy of progressive nationalisation of railway companies adopted by the Central Legislature in 1925. Four railway systems are owned by the Indian States of Hyderabad, Mysore, Bikaner and Jodhpur.

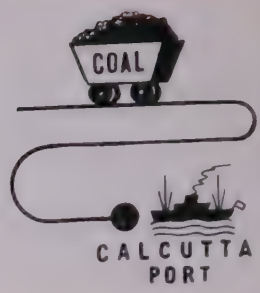
THE BENGAL AND ASSAM RAILWAY, which serves Eastern Bengal and Assam in normal times, provides transport for important jute and tea areas. The war in Asia made it a vital artery of supply to the Eastern Front. Mileage open is 3,555.

THE BENGAL NAGPUR RAILWAY, the most important mineral line in the country, traverses areas working coal, manganese and iron-ore mines. It links these areas with the ports of Calcutta and Vizagapatam. Mileage open is 3,376.

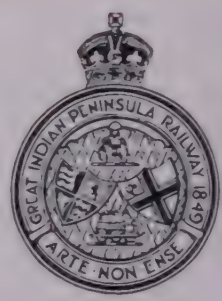
THE BOMBAY, BARODA AND CENTRAL INDIA RAILWAY (along with the G.I.P.) links the important cotton-growing areas of Western and Central India with Bombay. It has a suburban electrical service. Mileage open is 3,404.

Early to office? If you can !

THE EAST INDIAN RAILWAY runs through the rich coalfields of Bengal and Bihar and connects some of the most fertile regions of the United Provinces and Bihar with the port of Calcutta. Mileage open is 4,062.



THE GREAT INDIAN PENINSULA RAILWAY, besides connecting the Deccan and Central India with the important port of Bombay, serves an area rich in cotton and oilseeds. It has a suburban electrical service. Mileage open is 3,530.



Full steam ahead

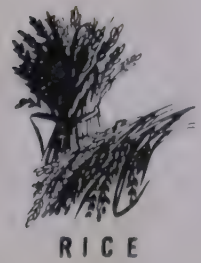
THE MADRAS AND SOUTHERN MAHRATTA RAILWAY connects some of the rice and cotton-growing areas of the South with Mormugao on the west coast and Waltair on the east coast. Mileage open is 2,941.

A steep gradient

THE NORTH WESTERN RAILWAY, India's longest railway system, serves the Punjab, the North-West Frontier Province, Sind and Baluchistan. It links these areas with the port of Karachi. One-third of its entire mileage is devoted to strategic lines. Mileage open is 6,885.

THE OUDH AND TIRHUT RAILWAY traverses some of the most important sugar cane and timber districts of India. Mileage open is 2,684.

Kumbh Mela—They came by train



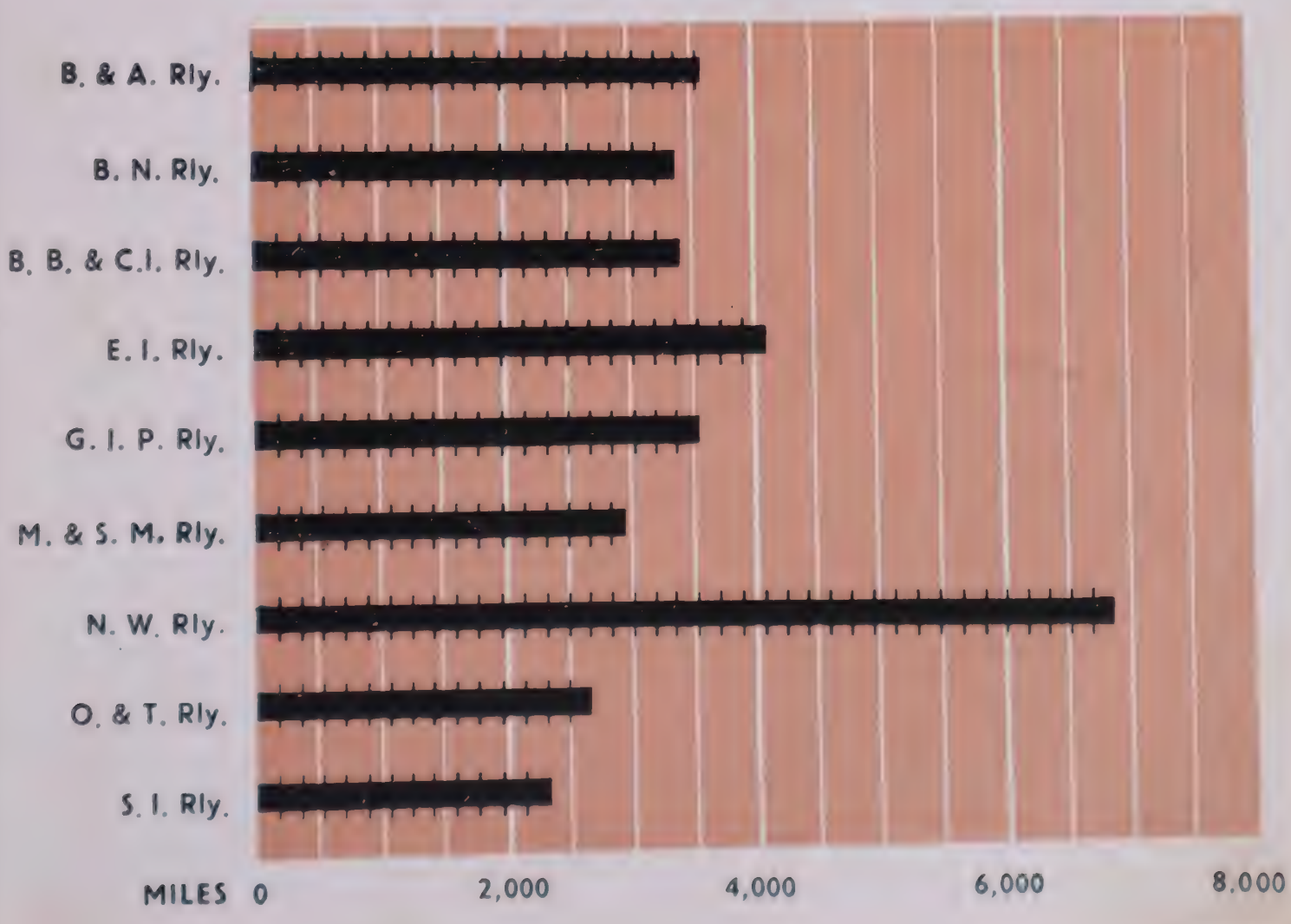
THE SOUTH INDIAN RAILWAY, which connects Madras with Dhanushkodi, is an important line for pilgrim traffic. It has a suburban electrical service. Mileage open is 2,349.

To Simla India's pre-war summer capital

Ganga Sagar Mela

Victory over rivers

Through the Hindu Kush mountains



LOOKING AHEAD

Now that the war is over, the Indian Railways aim to give quicker and better service. Post-war expansion of trade and industry must be accompanied by considerable extension of the channels through which trade flows. The extent to which railway development will be needed cannot be accurately assessed until the plans of other Departments and Provincial Governments are known. The tentative basic plan prepared by the Railway Board is, however, practical enough to operate without putting excessive strain on Government finance, and elastic enough to be enlarged or adjusted to conform to the needs of other maturing post-war schemes.

The war has caused abnormal wear on locomotives, rolling stock, track, and equipment in general. Owing to wartime shortage of materials, replacements and renewals are long overdue. This must be remedied, and the railway system strengthened generally to sustain the further increase in rail traffic that must inevitably follow in the wake of industrial expansion.

The plan envisages doubling of track, additions and alterations at stations and yards, and improvement in signalling and interlocking. Better watering arrangements for engines and coaches will also increase efficiency.

Railway advisory bodies are considering suggestions for the

The old and the new

Electric trains of the South

Diesel oil in place of coal

The new heavy Garratt

improvement of amenities for third class passengers. These include : the construction of new platforms; the raising, lengthening and surfacing of existing platforms; increasing the number of overbridges, latrines and waiting accommodation, and providing separate waiting rooms for women ; improving booking arrangements, vendors' stalls, restaurants, and the water supply at waiting halls, platforms and carriages ; and adding to the comfort of passengers by reducing the number carried in each compartment.

Another measure contemplated is the reduction of passenger classes to three, these to correspond in equipment to the present second, inter and third classes. There will be considerable improvement in all three classes. Important trains will provide de luxe air-conditioned accommodation.

Improvements planned include the provision of better working and living conditions for railway employees, and for expansion of existing facilities for free medical advice and attention.

It is intended to undertake construction of new lines, replacement of lines dismantled during the war, and gauge conversions, in an order of priority suited, on the one side, to the road development programmes of areas concerned, and, on the other, to special development plans of power, industry and agriculture. Areas for first action are being selected in consultation with Provincial Governments and other interests concerned, and surveys are being started so that selected projects can be prepared in advance for completion at short notice. The Railways may thus be in a position to provide employment for some of the surplus manpower.

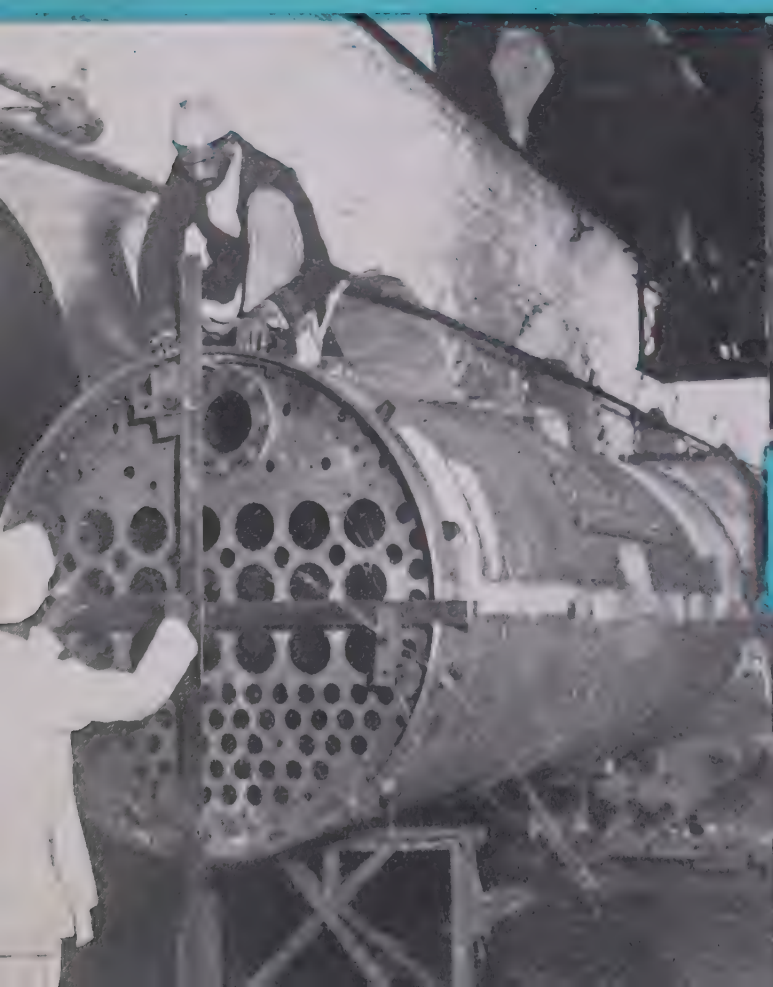
As an initial measure for a period of 10 years, a yearly construction of 500 miles of new railway is visualised. This programme is capable of expansion, and special consideration will be given to lines required for the development of the country, even if such services are likely to be run at a loss for some time.

Railway apprentices laying the track

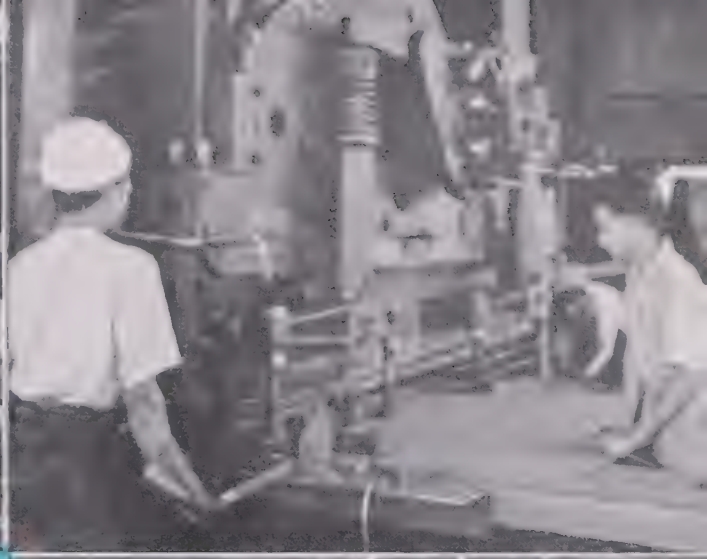
Inside a railway hospital

A boiler in hospital

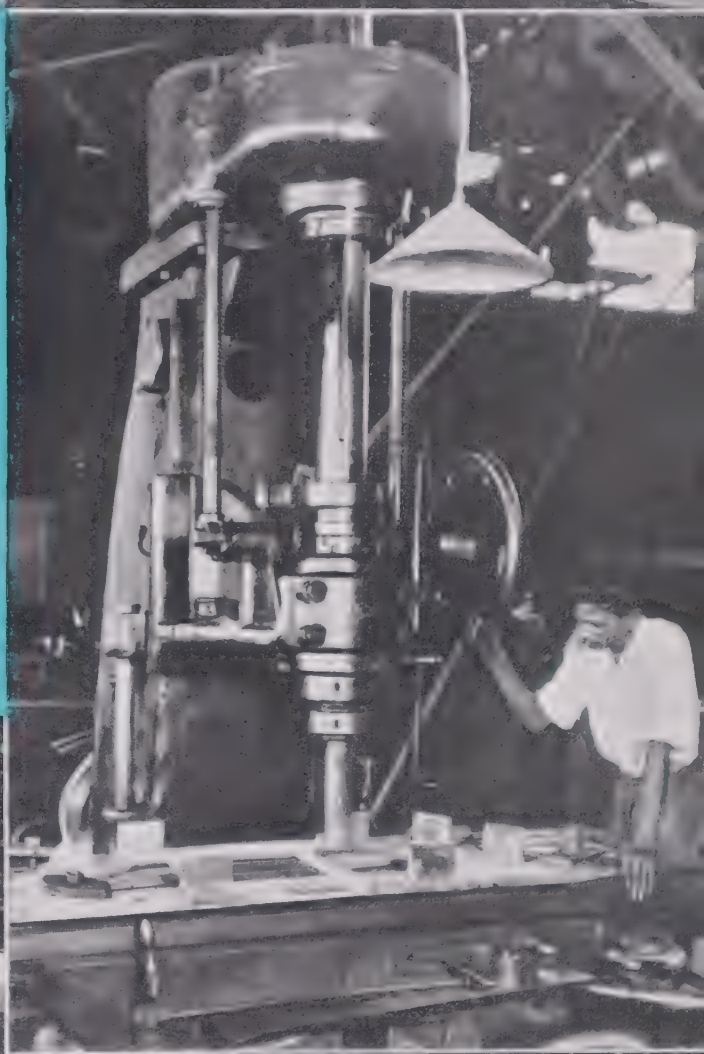
Calling at a station

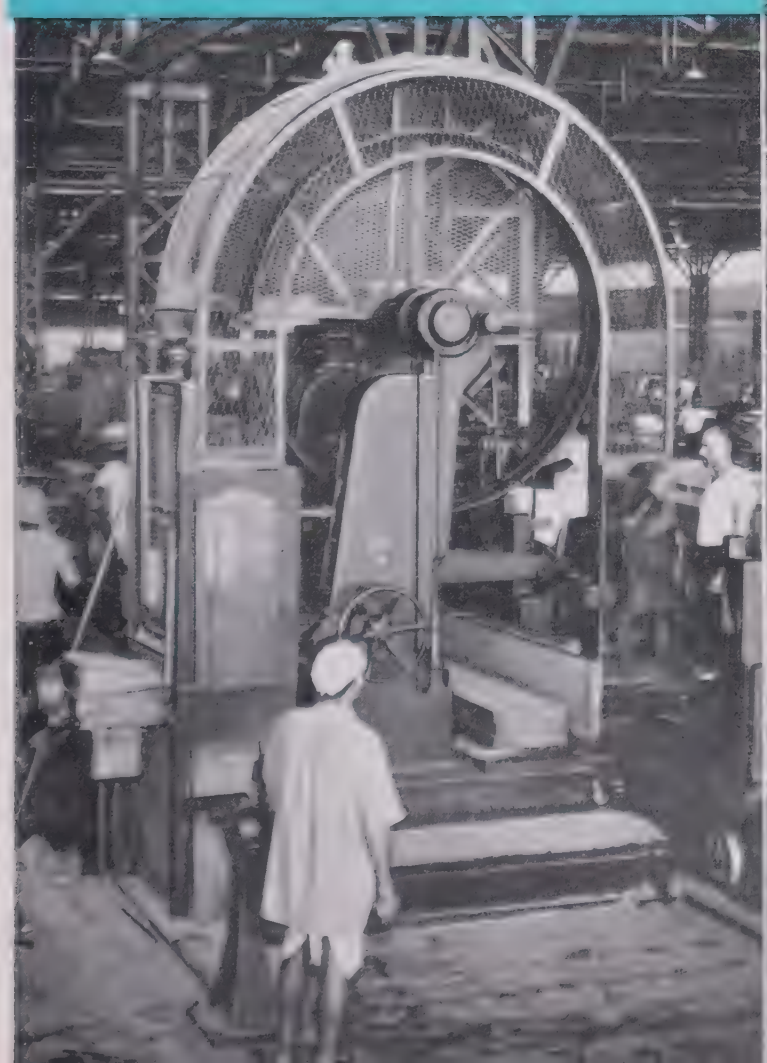


Carrying your mail



Railway workshops are a beehive of activity producing anything from wagons to varnishes. Here are a few glimpses

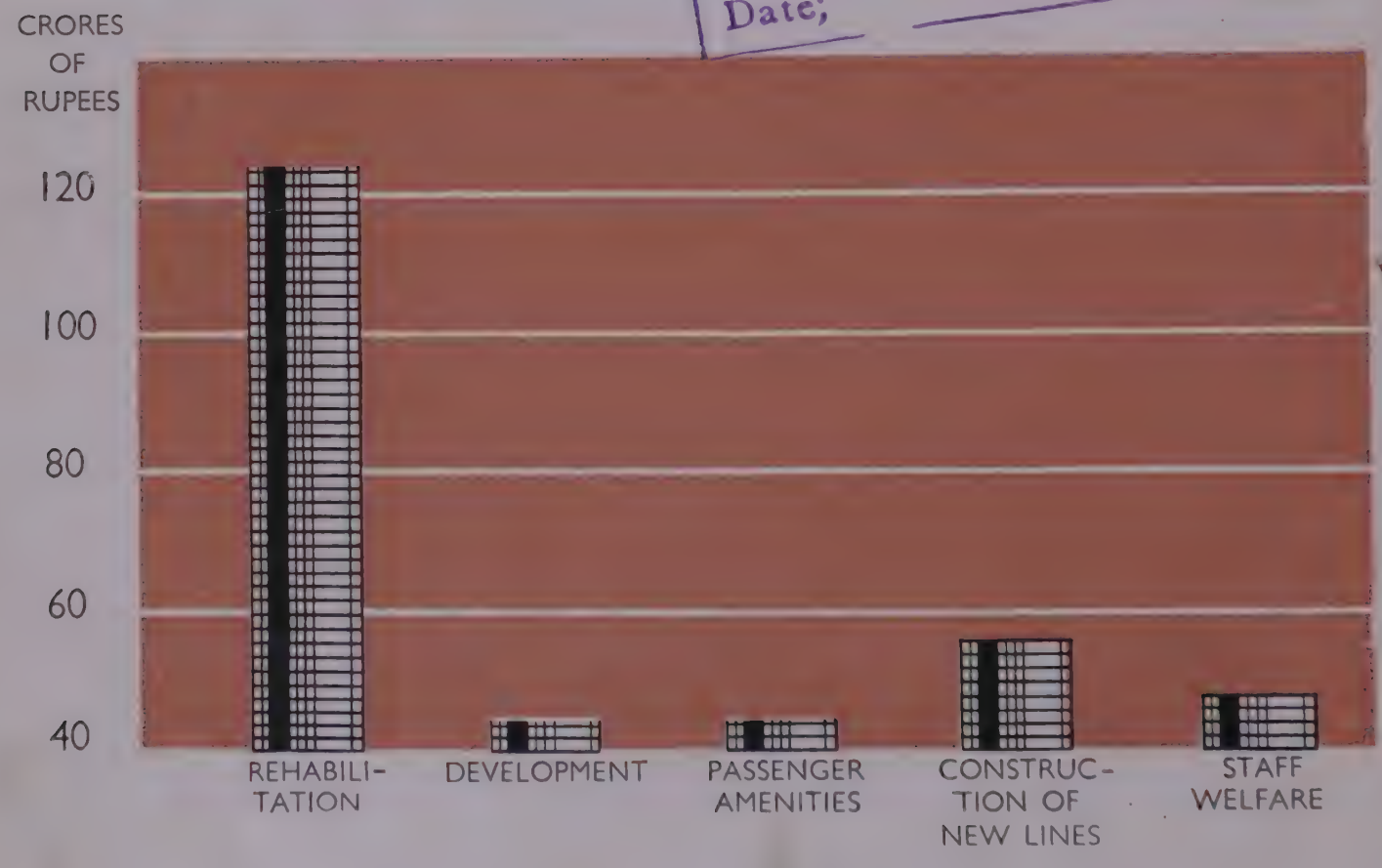




The tentative basic plan for post-war action includes a consideration of many proposals designed to increase the efficiency of the Railways. A railway workshop has already been placed under the management of Tata Sons, Ltd., for the purpose of manufacturing boilers at the start and complete locomotives afterwards. A second railway workshop is to be reorganised for the production, under State control, of locomotives and spare boilers. To increase efficiency and to achieve further economy, the manufacture of spares for locomotives, coaches and wagons is to be re-distributed among railway workshops. Another measure proposed is the revision of the rating policy in the interests of Indian industry and passenger traffic in general. A special committee has been set up to recommend ways and means of increasing Indian and foreign tourist traffic.

As it stands, the plan envisages an expenditure of Rs. 319 crores in the first seven years of the post-war period. It is proposed to distribute this as follows :—

LIBRARY
Blore 42
Accessi No; 3814
U.D.C
Date; 23-8-82



APPENDIX

MAIN STATISTICS OF ALL INDIAN RAILWAYS

	1938-39	1943-44
Gross Earnings (crores)	Rs. 107·15	Rs. 198·80
Total Working Expenses (crores) ..	Rs. 71·18	Rs. 113·86
Operating Ratio (per cent) ..	66·44	57·28
Number of Passengers originating (millions)	530·62	789·30
Passenger Miles (millions)	18,742·79	32,483·45
Earnings from Carriage of Passengers (crores)	Rs. 30·73	Rs. 67·11
Average Earnings per Passenger Mile (pies)	3·15	3·97
Freight Tons originating (millions)	88·36	95·88
Freight Ton Miles (millions) ..	22,158·84	28,360·58
Earnings from Carriage of Goods (crores)	Rs. 68·57	Rs. 102·82
Average Earnings per Freight Ton Mile (pies)	5·98	6·96
Total Train Miles (millions) ..	197·04	172·58
Gross Earnings per Train Mile ..	Rs. 5·40	Rs. 11·52
Working Expenses per Train Mile..	Rs. 3·58	Rs. 6·60
Net Earnings per Train Mile ..	Rs. 1·82	Rs. 4·92
Net Earnings per Mean Mile Worked	Rs. 8,619	Rs. 20,741

28 AUG 1986

Railway
Principal Ci

FOR REFERENCE C
PLEASE SEE INSI